

WHAT IS CLAIMED IS:

1. A method of processing data stored in a structured data source, comprising:
  - receiving a natural language input;
  - analyzing the natural language input to identify semantic information contained therein;
  - associating portions of the natural language input with a command object and an entity object of a schema based on the semantic information and the natural language input;;
  - and
  - rendering data from the data source in a table of columns and rows based on the schema, and the associated portions of the natural language input.
2. The method of claim 1 and further comprising accessing the database to identify words and phrases associated with dimensions in the data source.
3. The method of claim 2 wherein accessing further comprises identifying words and phrases associated with levels and values in the data source.
4. The method of claim 1 wherein associating further comprises associating portions of the natural language input with a frame object of the schema, wherein the frame object corresponds to how to render data.

5. The method of claim 1 wherein the command object relates to a task to be performed for rendering data.

6. The method of claim 1 wherein the entity object relates to data in the data source or to objects in the application.

7. The method of claim 1 and further comprising:

changing the table based on a further command received.

8. The method of claim 7 wherein the further command is highlighting a portion of the table.

9. The method of claim 7 wherein the further command is sorting a portion of the table.

10. The method of claim 7 wherein the further command is filtering information in the table.

11. The method of claim 7 wherein the further command is adding information to the table.

12. The method of claim 7 wherein the further command is clearing information in the table.

13. The method of claim 7 wherein the further command includes switching the row and column information.

14. The method of claim 1 and further comprising:

presenting candidate interpretations based on the natural language input.

15. The method of claim 1 and further comprising:

providing an interactive interface to a user for entering the natural language input.

16. The method of claim 15 and further comprising:

performing at least one of indicating recognized terms in the natural language input and providing candidate interpretations while a user enters the natural language input.

17. The method of claim 1 and further comprising:

rendering a natural language description of information in the table.

18. The method of claim 1 and further comprising:

maintaining a history of previous tables rendered for future use.

19. The method of claim 1 and further comprising associating portions of the natural language input with words and phrases associated with the data source.

20. The method of claim 1 wherein analyzing further comprises identifying ambiguous terms in the natural language input and presenting candidate alternatives for the ambiguous terms.

21. A computer readable medium having instructions for processing data in a structured data source including dimensions and values associated with the dimensions, the instructions comprising:

- a user interface module adapted to receive natural language input and render a table;
- a table generation module adapted to access the dimensions and values and define a schema for rendering the dimensions and values; and
- an interpretation module adapted to associate terms in the natural language input with an entity object of the schema corresponding to dimensions in the data source and generate candidate interpretations of how to render data in the data source based on the natural language input, the dimensions and the schema.

22. The computer readable medium of claim 21 wherein the user interface module is adapted to present the candidate table interpretations.

23. The computer readable medium of claim 21 wherein the data source includes levels associated with the dimensions.

24. The computer readable medium of claim 21 wherein the user interface module is adapted to render a table of dimensions and values from the data source based on at least one of the candidate table interpretations.

25. The computer readable medium of claim 21 wherein the interpretation module is adapted to compare words and phrases in the natural language input with the dimensions and values of the data source.

26. The computer readable medium of claim 21 wherein the interpretation module is further adapted to perform a semantic analysis of the natural language input.

27. The computer readable medium of claim 21 wherein the schema further includes a command object relating to a task to be performed and a frame object relating to how to render data.

28. The computer readable medium of claim 27 wherein the interpretation module is further adapted to

associate terms in the natural language input with the command object and the frame object.

29. The computer readable medium of claim 21 wherein the user interface module is adapted to present candidate interpretations to the user.

30. The computer readable medium of claim 29 wherein the candidate interpretations include multiple table configurations, wherein at least one configuration is associated with the same data.

31. The computer readable medium of claim 21 wherein the user interface module is adapted to allow a user to select one of the candidate interpretations in order to render a table associated with the selected candidate interpretation.

32. A method of processing information to drive an application, comprising:

- receiving a natural language input;
- analyzing the natural language input to identify semantic information contained therein;
- accessing a schema to identify a command object and an entity object based on the semantic information and the natural language input;
- and
- performing an action associated with the application based on the command object and the entity object.

33. The method of claim 32 wherein the application is a spreadsheet application.

34. The method of claim 32 wherein the action includes rendering data from a data source in a table of column and rows based on the schema.

35. The method of claim 34 wherein the action includes rendering a single cell of information from a data source based on the natural language input.

36. The method of claim 32 wherein the command object is associated with a command performed in the application and the entity object is associated with data used by the application when performing the command.

37. The method of claim 36 wherein accessing a schema further comprises identifying a frame object, wherein the frame object associates the entity object with the command object.

38. The method of claim 32 and further comprising presenting candidate interpretations of the natural language input based on the schema and the semantic information.

39. The method of claim 32 wherein accessing the schema includes identifying multiple entity objects.

40. The method of claim 32 wherein accessing the schema includes identifying multiple command objects.